13. PROTECTION AND DAMAGE PREVENTION

"*We can never have enough of nature. We must be refreshed by the sight of inexhaustible vigor, vast and titanic features . . . the wilderness with its living and decaying trees. We need to witness our own limits transgressed, and some life pasturing freely where we never wander*."[21]

There can be no dispute that preventing environmental damage is easier and less costly than trying to restore degraded ecosystems. The most effective prevention measure—prohibition of any destructive use of the land—generally is not an option on military installations. Therefore, a compromise between total protection and unrestricted military training must be reached.

Natural resources management on Fort Richardson is solidly connected to the military mission with the belief that effective training can be accomplished with minimal long-term environmental damage. In these days of continually shrinking resources, the military is becoming increasingly aware of the important relationship between sound environmental stewardship and high quality training opportunities. Neither one can exist without the other.

13-1 Objectives

- Foster a conservation ethic in those who use Fort Richardson's lands
- Distribute land-use activities, such as military training, recreation, restoration of training damage, and habitat management to minimize user conflicts
- Identify and provide protection for areas of special ecological concern

13-2 Environmental Awareness

Environmental awareness is a major component of the ITAM program. Its objective is to foster a conservation ethic in military personnel. Options used by Army installations include training courses and materials such as posters, videotapes, logos, maps, field handbooks, and pocket field guides.

Fort Richardson's Environmental Awareness program, initiated in 1995 with support from CEMML-CSU, is fully operational. The program includes a Leader's Handbook, soldier's pocket field guides, a videotape for the public and military personnel, and a series of posters.

USARAK has developed a Soldier's Handbook and an accompanying pocket field guide, designed specifically for use at Fort Richardson. The handbook includes an introduction to Fort Richardson and contains sections on regulation awareness, interfering with wildlife, protection of vegetation, fighting positions and concealment, snow clearing operations, other ground-disturbing activities, communication and obstacle wire, warming fires, and human and hazardous waste disposal and management. Adhering to these constraints will preserve the quality of training lands. A map is provided that shows special sensitive areas, such as wetlands, that should be avoided during training.

The pocket field guide is printed on waterproof paper. About 1,500 copies of the Soldier's Handbook

[21]Henry David Thoreau.

and 5,000 copies of the pocket field, guide were initially produced for distribution to soldiers and other military personnel who train on the post. Six different posters were designed, printed, and are continually placed in areas of high visibility where soldiers train.

USARAK has developed a video to educate military users on how to reduce impacts from military training. This thirteen minute video outlines soldiers' responsibilities for minimizing damage while training in the field. Soldiers learn tips on how to protect the training area from environmental damage, conceal their position without damaging native vegetation, maneuver vehicles without scarring the terrain, handle hazardous materials without contaminating soils or watersheds, remove snow without displacing road surfaces and ditches, and protect wildlife and their habitat from harassment and destruction.

Environmental awareness materials will be updated as needed during the next five years. The objective is to have up-to-date copies available for every unit operating in the field and to show environmental awareness videos to as many troops and public users as possible. Materials will probably begin undergoing modifications in 1998.

13-3 Training Requirements Integration

TRI is another component of the ITAM program. One objective of TRI is to site military missions (and other land uses) in areas best capable of supporting them. TRI relies on LCTA and other monitoring programs to determine land capabilities. TRI can include rest-rotation of training lands as well as scheduling lands according to their "carrying capacity" to support specific missions. TRI includes the restrictions necessary to maintain quality training land.

13-3a Training Area Rotation

At some installations, trainers rotate the use of training areas, rehabilitating damage during periods of non-use. This option is not practical at Fort Richardson. Instead, rehabilitation projects for training areas are coordinated with Range Control to close only specific project sites for the needed time to conduct reparations (see Section 14-11b). This system is more useful because the USARAK mission does not destroy large acreages. Regular closure of training areas is unnecessary due to minimal damage.

13-3b Siting of Training Activities

It is important to site training activities where natural resources can support them on a long-term basis. This saves restoration money and provides higher-quality training for troops. Siting new training activities and facilities is implemented most effectively on Fort Richardson through the NEPA process. The very nature of NEPA is conducive to siting activities on lands best suited for supporting them.

The ITAM Steering Committee (Section 11-5c) is an ideal forum for considering the military's mission requirements and the capability of lands to support them. The GIS will be used to provide the Committee with information and options concerning mission activities.

13-3c Training Restrictions

Restrictions on training are sometimes necessary to protect ecosystems. USARAK has incorporated environmental restrictions into U.S. Army Alaska Regulation 350-2, Range Regulation, last modified in 1995, especially Chapter 2 (Protection of Environmental Resources During Training) and Chapter 16 (Recreational Activities).

It is anticipated that the ITAM Steering Committee will help ensure enforcement of regulations designed to protect the quality of training lands on Fort Richardson. This committee, through its Brigade representatives, and DPTSM leadership, has direct access to both troop units and the Command. The Committee will have the option of requiring troops to repair damage or pay for repair when violation of published regulations results in damage.

There have been problems with "gouging" soil during snow removal at troop training sites on ranges. In 1997, special "shoes" were purchased (using environmental funds) for blades on snow removal equipment used on ranges. These "shoes" keep

blades 2-4 inches above the soil, allowing removal of most snow while protecting the soil. This simple mechanical solution should reduce soil damage and efforts by troop engineer units to repair such damage.

13-4 Wildfire

Wildfires are a concern at Fort Richardson, but rarely are they a significant problem. Severe drought conditions only occur about once every 20 years. In normal years, there is an average of less than five wildfires that are usually mission-related, small, and easily contained.

The Chugach Mountain slopes behind the Small Range Complex have a high potential for wildfires. Most fires started there are from tracer rounds and pyrotechnics fired from adjacent ranges when fire danger is high. Fires in this area can affect the already poor air quality of Anchorage and, if they escape, could burn north toward the community of Eagle River, southwest into Anchorage, or east into Chugach State Park. In addition, the recent spruce bark beetle outbreak, which has killed thousands of mature white spruce trees in the area, has led to public perception that there is an increased potential for wildfires due to excessive fuel loading.

USARAK is aware of this situation and is currently working with BLM fire management personnel to develop more protective measures that will reduce the existing threat of wildfires and also allow increased use of the firing ranges for training purposes.

13-4a Fire Prevention

Cutting lanes or firebreaks specifically for fire control is not the preferred method of fire prevention at Fort Richardson. Major highways, waterways, wet areas, and smaller roads act as firebreaks on much of the post. The likelihood of a fire crossing most of these natural firebreaks is so low that it is not cost effective to create and maintain firebreaks. Moreover, creating firebreaks causes loss of habitat, creates potential for severe erosion problems and creates opportunity for unauthorized access by off-road vehicles.

The Fire Department takes weather readings twice daily during fire season (June–September). Data is used to calculate Fine Fuel Moisture Content (FFMC), which is an indicator of the degree of danger from wildfire. FFMC is provided to Range Control, that then restricts types of ammunition and pyrotechnics allowed when fire danger is high.

13-4b Wildfire Suppression

The Fort Richardson Fire Department maintains the responsibility for first response for wildfire suppression. Due to the small size of most fires, this response is generally adequate.

Alaska Fire Services, a BLM agency, has primary responsibility for suppression of wildfires on military lands in Alaska. Under an Inter-Service Support Agreement, the Army provides facilities for Alaska Fire Services at Fort Wainwright in return for fire protection on Army lands.

The BLM reimburses the Alaska Division of Forestry (DOF) for wildfire suppression in the southern half of the state. Such support has been requested only twice in the past four years.

The DOF also provides training for wildfire suppression to Fort Richardson personnel. There is a mutual aid agreement with regard to fire suppression between USARAK and Elmendorf AFB (Elmendorf AFB, 1994).

13-4c Wildfire Impacts on Natural Resources

Wildfires probably had a more important influence on ecosystem functions during presettlement times. Even then, except during drought periods, fires were still relatively small and localized due to the weather and climate. With settlement came fire suppression and road systems (firebreaks) that further reduced ecosystem fire damage at Fort Richardson. Today,

the absence of wildfires may be inhibiting the potential for optimal ecosystem development. The current outbreak of spruce bark beetle infestation in old-aged timber is one problem due to a lack of wildfires.

Fires and fuel loads should be managed according to a long-range plan. USARAK, in cooperation with BLM's Alaska Fire Service and Anchorage Field Office, will develop a Fire Management Plan for fires and fuel loads during 1998–2003. Appendix 1 contains a description of the plan, its compliance authorities, and budget priority.

13-5 Special Interest Areas

"Biologically or geographically significant or sensitive natural resources . . . shall be inventoried and managed to protect these resources, and to promote biodiversity . . ."[22]

Designation of special protection status for important or fragile natural areas is an effective management tool. In accordance with AR 200-3, areas that contain natural resources that warrant special conservation efforts will be identified during the inventory and classification process. After appropriate study and coordination, such areas may be managed as "Special Interest Areas" for their unique features. Per AR 200-3, this INRMP "*will address the special management necessary for these areas, and all current and future land uses will consider the uniqueness of these areas and plan accordingly to ensure conservation of their resources*".

Fort Richardson has areas with special natural features. They harbor sensitive or unique wildlife species, represent unique plant communities, or possess unusual geologic or topographical characteristics. The following is a description of the currently identified special interest areas on Fort Richardson along with restrictions and stipulations for their use. Most of the information regarding these areas either has been or soon will be digitized in the GIS, and maps detailing restricted areas will be available to project planners.

USARAK will develop a Special Interest Areas Conservation Action Plan that will further define special interest areas and specific actions to protect or enhance them. Appendix 1 contains a description of the Plan, its compliance authorities, and budget priority.

13-5a Old-Growth Forest

Old-growth forests are defined as ecosystems dominated by old trees and related structural features that are characteristic of later stages of successional development. They differ from earlier stages in structure, composition, and function (Kaufmann et al., 1992). In the Pacific Northwest, where most old-growth research and public attention has been focused, six attributes have been used to characterize old-growth forests: large trees; snags; large down woody material; multiple tree canopy layers; associated shrub, herb, and grass components; and canopy gaps (USDA Forest Service, 1992). Old-growth attributes such as multiple canopy layers, large accumulations of dead and down trees, and multiple species are not found in all types of old-growth forests and can be found in earlier stages of successional development (Kaufmann et al., 1992). Sites that do not have a full complement of old-forest characteristics can partially function as old forests for those attributes that are present. Viereck et al. (1992) pointed out that old-growth is not synonymous with old age and must be recognized on the basis of stand characteristics.

Old growth forest near Waldon Lake.

Primary tree species that compose old-growth on Fort Richardson are paper birch and white spruce. Birch is relatively short-lived (80–120 years), while

[22]DOD Instruction 4715.3, Environmental Conservation Program.

white spruce is relatively long-lived (over 250 years). White spruce/paper birch is a recognized forest cover type in southcentral Alaska, but it is considered to be a transitional stage that follows paper birch and precedes the white spruce type (Eyre, 1980). Thus, old-growth in this region is very different from the Douglas fir/Sitka spruce/western hemlock forests of the Pacific Northwest and southeastern Alaska, which can attain ages of 500–700 years or more. For the purposes of this plan, old-growth on the post is tentatively defined as stands with the dominant trees being 150 to 200 years old. Trees of this age are rare on Fort Richardson due to fires that burned over much of the area in the 1920s and '30s. The spruce bark beetle has decimated much of the older spruce forest on the post as well.

Most of the old-growth forest type on Fort Richardson was thought to occur near Otter Lake, but other than that little was known of it. In 1995, a study was initiated to identify and characterize old-growth on the post (Section 12-3a(5)). Results of the study will be used to determine management strategies that will be based on the total acreage identified as old-growth and will likely emphasize some degree of protection for these stands. It will be important to manage the entire forest ecosystem so that some older stands are allowed to mature into old-growth over time.

High-quality groves of old-growth will be ideal for inclusion in the Watchable Wildlife program on Fort Richardson. Such special areas will be marked for protection from damage and identified in brochures indicating special places to visit on post (when compatible with troop training activities). Areas that have special military training restrictions denoted will be included in the map described in Section 12-3a(5).

Surveying Fort Richardson's old growth forest.

13-5b Krummholz

Beyond treeline, species usually considered as trees are so stunted that they are more like shrubs. These stunted trees are called krummholz, a descriptive German word meaning "elfin timber" or "crooked wood".[23] Krummholz growth habit is shrubby and dense, becoming more prostate, twisted and contorted with altitude. Treetops are flat or flagged or both; trunks are gnarled. Basal branches form impenetrable masses of long intertwined serpentines, impossible to walk through.

Krummholz is found in the subalpine areas of Fort Richardson.

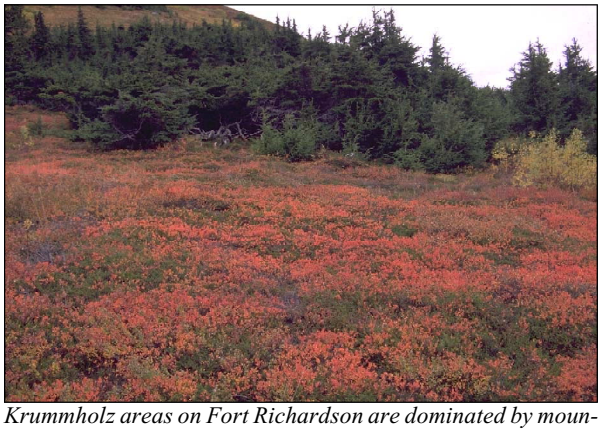
Any of the evergreen tree species of the subalpine forest may be represented in the krummholz. Since krummholz trees rarely produce seed, most seedlings sprout from seeds blown up from lower altitudes. They then become established in pockets of the subalpine regions that provide suitable microhabitats. Propagation of this unique vegetative community is most commonly carried out by "layering", the rooting of tree branches that come in contact with the soil. The erratic topiary shapes of krummholz represent the outer boundaries of a favorable microclimate that is circumscribed by cold temperatures and abrasive drying winds. Only the part of the krummholz covered by the snowpack escapes winter damage.

Single krummholz trees are stunted and seldom exceed six to eight feet in height. Many of these trees are flagged; the top branches pruned back by the

[23]Zwinger, Ann H. and Beatrice E willard (1972). Land beyond the Trees. University of Arizona Press, Tucson.

desiccating effect of winter wind. Only the leeward branches remain on the trunk, semi-protected by its mass, looking like arboreal wind socks. The age varies; some krummholz trees in Rocky Mountain National Park have been cored out to be over 300 years. The oldest tree was 390 years of age. When krummholz does become established, it dominates the microhabitat, out-competing many other subalpine plants. Many tundra creatures shelter near the krummholz, and many lower altitude plants are able to extend upward within its protection.

Fort Richardson has classic examples of krummholz vegetation communities in the subalpine regions. Infantry Flats is accessible by an all-weather road and a trail leads through the krummholz patches of evergreens. The dominant krummholz evergreen in the subalpine zone is mountain hemlock (*Tsuga mertensiana*). It grows in large patches of an acre or more in forest groves beyond the upper limits of the boreal forest. These groves may attain a height of 15 feet. Other krummholz evergreens are white spruce trees that grow as single trees; the top branches often flagged. One other evergreen species found growing in the subalpine region is juniper (*Juniperus communis*), which attains a height of about three feet. The juniper does not appear to be stunted nor is it twisted and gnarled.



Krummholz areas on Fort Richardson are dominated by mountain hemlock.

13-5c Alpine Tundra

Alpine tundra is the most extensive, ecologically sensitive area on Fort Richardson. The area is shown on the vegetative map (see Figure 12-3a(8)). The major restriction imposed on this area is the prohibition of vehicular traffic off roads and trails indicated on the training map.

The alpine tundra is the most ecologically sensitive area on Fort Richardson.

13-5d Cultural Resource Areas

USARAK takes special measures to protect its cultural resources. An Integrated Cultural Resources Management Plan for Fort Richardson is being developed and will be completed in 1998. This plan will provide guidance for the inventory and evaluation of historic buildings and archaeological resources. See Section 19 for more details.

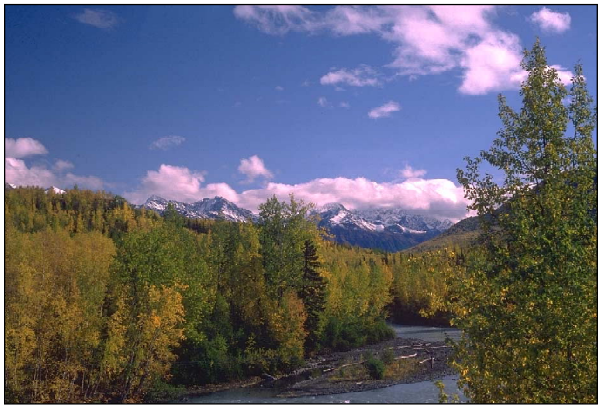
13-5e Ship Creek Riparian Area

Ship Creek and its riparian habitat are important and sensitive areas on Fort Richardson, requiring protection to insure maintenance of its health and natural function. Water quality on Ship Creek is of utmost importance because any deterioration on Army lands will affect downstream locations on Elmendorf AFB and in the City of Anchorage. USARAK's goal is to maintain Ship Creek in a condition as pristine as possible and to repair portions that may become damaged. Further development, beyond that already approved for the golf course expansion, will not occur in the riparian area. Tree cutting will be prohibited. Clearing for the golf course will be limited to that absolutely necessary for course construction. Troops and other authorized users will continue to have "pass through" access.

13-5f Eagle River Corridor

Approximately 8 miles of the glacial fed Eagle River pass through Fort Richardson. The river, characterized by a swift cold current with high sediment loads, supports native runs of all five species of Alaskan salmon. It is important for both military training and recreational activities. The river corridor on Fort

Richardson varies between steep bluffs and low lying wetlands. Besides Ship Creek, it is the only area on the installation with a substantial riparian ecosystem. It is USARAK's goal to maintain this corridor in a natural condition with the exception of some periodic construction activities at two bridge crossing sites.



Eagle River corridor varies between steep bluffs and low lying wetlands.

13-5g Other Riparian Areas

There are other small riparian areas on Fort Richardson that require special protection. These areas include Fossil Creek and Clunie Creek. As stated in Section 12-3e, these areas are being identified, and they will be protected as required. Restrictions on military training (Section 13-3c) and recreational activities provide some measures that protect riparian ecosystems.

13-5h Lakes

Major lakes are important to ecosystem integrity and outdoor recreation on Fort Richardson. Often, older forests are associated with these lakes. There are certain military activities that can occur on or near these lakes without significant damage to either natural processes or outdoor recreation opportunities. Section 13-5i describes the special considerations associated with these lakes and other recreational areas. All military activities planned for these lakes and their immediate surroundings will require approval from the Natural Resources Branch prior to implementation. Vehicular maneuvers or intensive bivouac operations will not be permitted in these areas without such approval. Dog training is prohibited at Fort Richardson's lakes, with the exception of Thompson Lake, Derby Pond, and Dishno Pond.

Some lakes are losing their pristine quality (e.g. Waldon Lake) due to abuse from users. The establishment of quality roads, parking areas, barricades, and trails will significantly improve the ability of natural resource managers to control the distribution of use. Such improvements are described in Sections 17-5 and 18-5.

13-5i Eagle River Flats

ERF is an important 2,136-acre coastal halophytic salt marsh on the Knik Arm of upper Cook Inlet and the post's premier wetland. Lower Eagle River bisects the marsh. The marsh and associated shallow ponded areas are heavily used as a stop-over and feeding area for migrating waterfowl. Sensitive waterfowl species, such as trumpeter swans and snow and white-front geese, utilize the flats during migration periods in the spring and fall. Numerous research projects have been conducted in ERF as a result of waterfowl poisoning from white phosphorus, a component of some Army munitions. Remedial studies and pilot treatments are being conducted and will continue into the future. As described previously (Sections 3-2 and 11-8), there are stringent restrictions on the use of ERF due to its history as an impact area and the continued presence of unexploded ordnance.

13-5j Other Wetlands

Wetlands protection is required by Executive Order 11990, *Protection of Wetlands*. NEPA is the process used to evaluate projects for wetlands impacts. Any uses of wetlands will be reviewed by the Natural Resources Branch. If necessary, the U.S. Army Corps of Engineers will be consulted to determine

Wetlands protection is mandated by Executive Order.

whether jurisdictional wetlands are involved. Wetlands management practices are discussed in Section 14-9.

13-5k Glenn Highway Greenbelt

The seven miles of the Glenn Highway that bisect Fort Richardson is an important scenic roadway in the Anchorage urban area. The area bordering Ship Creek and the Glenn Highway is excluded from most military training activities and is not part of active training areas (Figure 10-1d(1)). The exclusion is needed to protect and maintain the visual barrier between the post and the heavily traveled thoroughfare.

USARAK's goal is to maintain the greenbelt in a condition as pristine as possible and to enhance portions of the greenbelt damaged by development. Where necessary, trees will be planted to screen developed areas, such as the machine gun range and the National Guard site. The Army is committed to protecting the aesthetics of natural forests along the Glenn Highway.

13-5l Other Special Interest Areas

Fort Richardson has other unique sites that qualify as special interest areas. Special consideration is afforded to areas described below when evaluating projects or activities that might negatively impact them.

13-5l(1) McVeigh Marsh Waterfowl Refuge

McVeigh Marsh is a sensitive and important ecological area where large numbers of waterfowl nest and rear their young. Up to 10 species of waterfowl use McVeigh Marsh. Protection of waterfowl, wetlands, and hydrology are all important factors of consideration in management of McVeigh Marsh.

McVeigh Marsh.

13-5l(2) Otter Lake and Otter Creek Wildlife and Recreation Area

The Otter Lake vicinity is an important nesting area for diverse waterfowl and songbird populations. The lake is also an important recreation area with overnight camping and day use picnicking facilities. The lake is stocked with rainbow trout each summer, and is an important military and Anchorage area sport fishery. Otter Creek supports important wildlife habitat for silver salmon (spawning and rearing), mink, and river otters.

13-5l(3) Gwen Lake Wildlife and Recreation Area

Gwen Lake and vicinity includes three small lakes that are important wildlife habitats for beaver and waterfowl. Gwen Lake is also a day use picnicking and tent camping area. The lake is stocked with rainbow trout and is an important sport fishery for military and civilians in the Anchorage area. Rainbow trout feed on a rich freshwater shrimp resource and display growth rates in summer that are unrivaled in southcentral Alaska.

Fishing on Gwen Lake.

13-5l(4) Clunie Lake Wildlife and Recreation Area

Clunie Lake is known for its nesting loons. Protection of remaining habitat for these sensitive waterbirds is of primary importance as human disturbance throughout the Anchorage area is causing significant reductions in their numbers and former territory. Clunie Lake is a designated day use picnicking and camping area. It also is a sport fishery for military and Anchorage area users, with rainbow trout being stocked annually.

Clunie Lake is known for its nesting loons.

13-5l(5) Waldon Lake Wildlife and Recreation Area

Waldon Lake is another lake used by loons. It also is a sport fishery and is stocked with rainbow trout and other species of fish each summer.

13-5l(6) North Fork Campbell Creek Anadromous Fish Stream

The North Fork of Campbell Creek on Fort Richardson is a spawning and rearing area for king salmon. High water quality and low disturbance to spawning grounds must be maintained. Permits are required for any activity that may affect the anadromous features of this creek.

13-5l(7) Chester Creek Anadromous Fish Stream

Chester Creek on Fort Richardson is a spawning and rearing area for silver salmon. High water quality and low disturbance to spawning grounds must be maintained. Permits are required for any activity that may potentially affect the anadromous nature of this creek.